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NOTES ON SOME FROGS FROM PERU AND ECUADOR.

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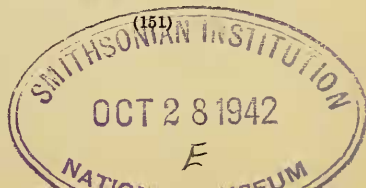
In connection with some notes I have to present on the strange, casque-headed Hylid, *Tetraprion*, it seems desirable to record a few other species from Ecuador and Peru, one of them apparently undescribed. Most of the frogs form part either of a small Ecuadorian collection purchased by the Natural History Museum of Stanford University from Mr. William Clarke-Macintyre of Quito or of a rather extensive series received from my friend Mr. William G. Scherer of the Evangelical Mission at Pevas, Peru. The Pevas frogs were collected by Mr. Scherer's son, Paul Scherer, to whom I take pleasure in dedicating the new species. One of the *Tetraprion* was a gift from my former classmate, Dr. Donald L. Frizzell, of Negritos, Peru.

Edalorhina perezii Jiménez de la Espada.

One fine example (no. 5043) from Avila, Rio Napo, Ecuador, at 500 meters, May 1939, Wm. Clarke-Macintyre. This is one of the most unusual and delicately marked of frogs, and records of it are extremely rare.

Eupemphix schereri, new species.

Diagnosis.—A *Eupemphix* with a median tarsal tubercle, a variable series of lateral dermal glands in front of the groin, the upper surfaces rough with minute rounded spinose warts of unequal size, a well developed lateral parotoid gland (without distinct superomedian border) behind the tympanum, tympanum dorsally obscured but its anteroventral half distinct and its size two-thirds the diameter of the eye, a projecting snout, slender fingers with expanded rounded tips, first finger longer than the second, sole without tubercles except the two metatarsals and the normal strong subarticular ones on the free parts of the toes; tibiotarsal articulation reaching the eye when leg is brought forward, undersurfaces uniformly smooth, a large black inguinal spot which includes all or nearly



all of the largest (posteriormost) pre-inguinal gland, the large black spots of the undersurfaces confined to the lower belly and hind legs, the posterior part of the belly and underparts of legs with white ground color, the breast and throat becoming progressively darker brown forward, a median light line from the chin to the end of the dark breast color, and anchor-shaped terminal phalanges.

Holotype.—Stanford Amphibian Cat. no. 6317, a female taken at Pevas, at the mouth of the Ampiyacu River, Amazonian Peru, in 1940, by Paul Scherer.

Paratypes.—Cat. nos. 6316, 6318, 6319, three examples of similar size taken at the same locality by the same collector.

Measurements of the holotype in mm.—Snout tip to vent 30. Total length with legs outstretched 75. Eye 3.5. Femur from midline of body 15. Femur 16. Foot from tibiotarsal joint to tip fourth toe 22. Width head at ricti 10.

Comparisons.—Unfortunately I have comparative material only of *E. pustulosus* from Panama. From that species *schერი* is abundantly distinct in the total absence both of the longitudinally elongated warts of the dorsum and of the numerous crowded unequal tubercles which cover the sole in *pustulosus*, not to mention the partially free tympanum. The other species bearing a median tarsal tubercle all have longer legs than *schერი*, except *ruthweni*, which has a shorter first finger. *E. schერი* is doubtless close to *petersi*, but appears to differ in the half obscured tympanum, the longer first finger, the presence of smooth flat warts on the dorsum, and perhaps in the color, which is not too well described for *petersi*.

Hyla reticulata Jiménez de la Espada.

Two specimens of this rare and bizarre little frog (nos. 6322–6323) from Pevas, Rio Ampiyacu, Amazonian Peru, collected in 1940 by Paul Scherer. In the smaller, most of the dorsum and leg surfaces are whitish with a few rounded, closely appressed maroon spots with white interspaces down the back; the sides of the snout, surfaces of the arms, and some of the sides with maroon spots and narrow white interspaces forming a giraffe-like reticulation. The larger example is not whitish, but brown, and the dorsal band of spots, as well as those on the legs, are also set close in a reticulated pattern. I have never seen quite such a striking color pattern in a frog.

Tetraprion jordani Stejneger and Test.

On Feb. 19–20, 1938, I was the guest of Señor Raphael Valdez, chief of the great "Ingenio Valdez," at Milagro, thirty or forty kilometers up the Quito railroad from Guayaquil. After a very pleasant dinner with Señor and Señora Valdez at their new home, we walked down the street to the old residence, which Señor Valdez had graciously turned over to us for the night. Upon opening the screen-door of the porch, a tree-frog hopped from the step across my foot and was promptly caught. Next day I took the frog back to Guayaquil with me, and kept it alive in a wetted sack for a week or more on shipboard. The creature was very alert, with greatly protruding eyes, but nothing in its appearance suggested anything

more than one of the numerous, larger, long-legged, flat-headed, plain brown *Hylas* common in South America.

Upon preservation, however, the creature's head bent sharply forward at the basicranial line, and later, upon examination in the laboratory, the presence of parasphenoid and palatine teeth, together with the hard, bony skull, immediately placed it as the long-lost *Tetraprion jordani*, described in 1891 from a single, poorly preserved example from Guayaquil, and never, to my knowledge, seen since.

It is rather amusing to note that this frog was described the very year Stanford University opened, that it was named for the late David Starr Jordan, first president of Stanford, and that its rediscovery awaited the nearly half-century-later chance meeting of a frog and a Stanford zoologist upon a doorstep during the only night the zoologist spent on Ecuadorian soil.

In 1941, Dr. Donald L. Frizzell, a Stanford classmate of mine who is now an oil geologist at Negritos, in northwestern Peru, sent us a small herpetological collection containing a third specimen of *Tetraprion jordani* caught by himself and Mrs. Harriet Frizzell on Puná Island, in the Guayas estuary. This third example is an adult and shows that the type and my Milagro specimen were both immature and do not exhibit the full cranial development of the species.

The Milagro frog (Cat no. 2272) is 50 mm. in length and shows no appreciable supra-ocular, rostral, or basicranial expansions of the cranial casque. The edges of the snout are rounded, the basicranial transverse ridge is barely evident, and the top of the skull, though concave, has no well developed superior ridges. The rostral notch, evident in the figure of the type, is barely indicated. The Puná Island frog (Cat. no 6407) is 79 mm. from snout to vent. Its casque shows a bizarre development comparable to that of *Tripurion* and *Diaglena*. The flange of the upper lip is produced evenly outward all the way around from rictus to rictus, the flange being level in side view. At the snout-tip there is a deep, narrow, median cleft back to the "normal" point of the snout, the two ends of the lip flange flanking the cleft each being here developed into a small boss. Separated from these adjacent bosses, but running backward from them to each eye, are the two separate, prominent, gently up-sloping, highly developed canthal ridges, the skull between them deeply concave. Below these canthal ridges the lores are also deeply concave. The nostrils, set just behind the bosses and below the anterior origins of the canthal crests, are more than three times as far from the eyes as from the snout tip. The tympana have heavy "eaves" over them formed by the projecting lateral edges of the cranial plate, and the hind border of this plate is upraised into a well developed bony rampart across the basis cranii. On each side of the midline, this rampart is sigmoid in its rear elevation; beginning at the depressed center, it rises, rounds off, and slopes downward concavely to the rear end of the tympanal eaves.

The belly is roughly but evenly granular, the midsection of the dorsum almost completely smooth, and the sides are roughened by the very coarse, wartlike granulation. Upper surfaces of legs almost completely smooth.

The question of the generic arrangement of the casque-headed *Hylids* is a vexed one. It is generally held but perhaps not formally advocated view that the various "genera" have been separately derived from different species or sections of *Hyla* and that the similar cranial modifications do not necessarily indicate direct relationship. I must dissent from this view. I have compared *jordani* with examples of *Tripriion petasatus* and *Pternohyla fodiens*, as well as with *Diaglena spatulata*,¹ and have rather carefully examined the accounts and figures of *Corythomantis*, *Aparasphenodon*, and *Garbeana*. The cranial casques of certain of these genera bear such a close similarity of pattern (if not of detail) that I find it hard to believe that they are not derivatives of a single stock. This applies particularly to *Diaglena*, *Corythomantis*, *Tripriion*, and *Tetrapriion*, and in my opinion these genera should be grouped together. The fact that certain fresh-water fishes of western Ecuador bear a close faunal relation to Central American forms lends some support to the direct relationship of the Mexican frogs with *Tetrapriion*, while the isolation of some of the forms in southern Brazil is paralleled by the relation of certain fishes of the southern Brazilian streams (*Hollandichthys*) to those of western Ecuador (*Pseudochalceus*). Moreover, *Garbeana* has an intermediate range, in the Amazon basin. *Pternohyla* and *Aparasphenodon* seem rather different, and may not belong to the *Tripriion-Corythomantis* series, but I hesitate to express any definite opinion without seeing the latter genus. *Hyla ceratophrys* from Panama may also belong to the casque-headed group but its position is still obscure.

It will be noted that I retain the monotypic genus *Tetrapriion*. *Tripriion* has been held abundantly distinct from the other casque-headed forms because of the vertical pupil, a character that many herpetologists now feel is often of lesser importance than formerly thought. After comparing *jordani* directly with *petasatus* and *spatulata* I am quite sure that it is even more distinct from the latter than from the former, and although I believe all three to be rather related, I think that the actual relationships are best expressed by recognizing each as a distinct genus. Taylor's recent (1942) description of a new form, *Diaglena reticulata*, from Oaxaca, agreeing with *Diaglena spatulata* in all of the characters I consider to be essentially generic strengthens my view that *Tripriion*, *Diaglena* and *Tetrapriion* should be regarded as of generic rank. To ignore all the other characters and place *Tetrapriion* in *Diaglena* merely because of the pupil shape and palatine teeth (as Nieden and others have done), completely violates my own conception of the relationships, since I consider *Diaglena* to be somewhat closer to *Tripriion* than to *Tetrapriion*, in spite of the pupil and palatine teeth. More real difficulty is likely to appear in working out the relationships of some of the Brazilian forms to *Tetrapriion*, but until I have seen specimens of them I prefer to withhold judgment. From the figures, none of the Brazilian genera seem to have a "split snout" like that of *Tetrapriion*.

My views of the relationships are expressed in the following synopsis:

¹ I must thank Dr. E. H. Taylor for his great kindness in lending me two fine examples of *Diaglena spatulata*.

- 1a. Upraised canthal ridges not confluent anteriorly to form a median ridge; labial flange of cephalic casque strictly rectilinear in side view, not projecting far beyond jaws and its tip deeply but narrowly notched in adults; vomerine, parasphenoid and palatine teeth present; pupil round.....1. *Tetraprion*.
- 1b. Upraised canthal ridges confluent anteriorly to form a short to long median rostral ridge; labial flange of cephalic casque curved in side view, its tip entire and projecting far beyond jaws; vomerine, parasphenoid and sometimes palatine teeth present.
 - 2a. Pupil rounded or squarish; palatine teeth present; labial flange of cephalic casque curved and with a sharp upwardly directed angle before level of eye.....2. *Diaglana*.
 - 2b. Pupil a vertical slit; no palatine teeth; labial flange of cephalic casque curving rather smoothly upward and then backward, without a sharp angle before level of eye....3. *Tripriion*.

Taylor notes that in *Diaglana reticulata* the canthal ridges do not unite to form a prominent, median, rostral ridge as in *D. spatulata*. However, his specific description and figure show that the canthal ridges unite and that a short, low, rostral ridge is present. Some may argue that the characters relating to the cephalic casque are only specific and have no place in a generic key. But an inspection of these three genera will show the considerable differences in the cranial ridge *pattern* in these frogs, differences which I can regard only as generic.

Dendrobates parvulus Boulenger.

One typical specimen (no. 6332) from Pevas, Ampiyacu River, Amazonian Peru, collected in 1940 by Paul Scherer.

Hyloxalus fuliginosus Jiménez de la Espada.

One example of this rare frog (no. 5076) from Abitagua, Oriente, Ecuador, altitude 1200 meters, August, 1939, Wm. Clarke-Macintyre.

Elachistocleis ovalis (Schneider).

One example (no. 3152) from Pevas, Rio Ampiyacu, Amazonian Peru, Sept. 22, 1937, Paul Scherer, agrees entirely with this species in the structure of the pectoral girdle, but differs widely in color. The dorsum and upper leg surfaces are light brown, with a longitudinal median cloudy area the rear borders of which bear a small blackish spot above each groin and run on to form a bar across each femur, tibia and tarsus. The edge of the dorsal light color is very sharply defined, all the way from the snout tip and upper eyelid to the knees, by the deep brown color of the sides, which gradually lightens below till it merges into the brown reticulation of the belly and under surfaces of the legs. Throat dark, lightening towards chest, with a median light hair line.